

SECTION 16010  
GENERAL ELECTRICAL

PART 1 - GENERAL

1.1 RESPONSIBILITIES

- A. The Bidding Requirements, Conditions of Contract, General Specifications and Special Conditions, and this Division shall be binding on the Contractor and shall apply to all electrical work to be completed under this section.
- B. The Contractor shall be responsible for the work from the date of his Contract until its acceptance by the Contracting Officer and must make good all damages sustained from whatever cause. He shall use proper care and diligence in bracing and securing all parts of the work and shall in all cases judge as to the amount of protection required.

1.2 ORDINANCES, LAWS AND CODES

- A. All work shall conform to the rules and regulations of the National Electrical Code, Local Code, "Occupational Safety and Health Act" and the State Fire Marshall's Office. All certificates of approval shall be delivered to the Contracting Officer before final payment will be made.
- B. Should any change in the drawings and/or specifications be required to conform to the above mentioned laws and ordinances, the Contracting Officer shall be notified by the Bidder prior to the Bid Date, that the necessary changes may be completed. After the Bid Date, all work necessary to meet the requirements shall be at Contractor's expense, with no additional cost to the Contracting Officer.
- C. The Contractor shall pay all fees, permits or taxes for inspections, etc., in connection with the work under this Contract.

1.3 DATA AND MEASUREMENT

- A. The data given herein and on the drawings is as exact as could be secured insofar as building construction and existing conditions are concerned. Extreme accuracy is not guaranteed. The drawings and specifications are intended for the assistance of the Contractor in achieving the end result. Exact locations, measurements, distance, levels, etc., will be governed by conditions at the Job Site.
- B. The Contractor shall verify that the size of the equipment supplied by the selected manufacturers does not exceed the available mounting space.
- C. The Contracting Officer reserves the right to change location or size of conduits, outlets, fixtures or other pieces of equipment as may be necessary to avoid conflicts. No extra compensation will be allowed for such changes unless additional cost to the Contractor is caused.
- D. The Bidder shall visit the Project Site that he may have knowledge of conditions at the Job Site and adapt his work to such conditions.

1.4 DRAWINGS AND SPECIFICATIONS

- A. Anything mentioned in this specification and not shown on the drawings or vice versa shall be of like effect, as shown or mentioned in both. In any case of discrepancy or differences in the figures,

drawings or specifications, the Bidder shall promptly report such discrepancies to the Contracting Officer who shall make a decision in writing. Any adjustment by the Contractor without this decision shall be at the expense of the Contractor.

#### 1.5 QUALITY OF WORKMANSHIP

- A. The Contractor shall give his personal superintendence and direction to the work. He shall also keep a competent foreman or superintendent on the Project.
- B. All equipment, controls and junction boxes shall be located for ready access, operation, repair or maintenance.
- C. Any additional drawings necessary for the prosecution of the work will be furnished by the Contracting Officer as promptly as possible. The Contractor shall request any additional instructions needed and shall do no work without drawings and instructions.
- D. Any discrepancies between the Drawings shall be reported to the Contracting Officer prior to the Bid Date.

#### 1.6 GUARANTEE

- A. This Contractor shall guarantee all materials, workmanship and the successful operation of all apparatus furnished and installed by him for a period of one (1) year from the date of the final acceptance of the whole work, and shall guarantee to repair or replace at his own expense any part of the apparatus which may show defect during that time, provided such defect is, in the opinion of the Contracting Officer, due to imperfect material or workmanship and not to carelessness or improper operation. Guarantee period for the replacement shall begin with the date of replacement.
- B. The Contracting Officer shall notify the Contractor of any failure of any part or parts which occur during the guarantee period.
- C. The Contractor shall also guarantee the systems and the apparatus to be working properly to meet all conditions as specified.

#### 1.7 SHOP DRAWINGS

- A. Shop Drawings shall be submitted in accordance with the requirements of Section 1B. On or before thirty days after Award of this Contract, the contractor shall submit seven (7) copies of all fabricated work and equipment to be purchased of the General Conditions. Data shall be sufficiently completed to permit evaluation and comparison with specified equipment and material.
- B. All drawings shall bear the Contractor's stamp of approval and must be dated.
- C. Shop Drawings shall include, but not be limited to the following:
  - 1. Wiring Devices.
  - 2. Contactors and Circuit Breakers.
  - 3. Conduit and Wire.
  - 4. Identification products.
- D. A notation shall be made on each item submitted as to its specified use or description of specific location in the work.

- E. None of the preceding items shall be purchased, delivered to the site or installed until the item has been properly submitted in writing and reviewed by the Contracting Officer.
- F. Submittals shall be made even though the item is exactly as specified.
- G. Should the Contractor fail to comply with any of the requirements as stated, the Contracting Officer reserves the right to select a full line of materials, appliances and equipment, which shall be final and binding upon the Contractor.

#### 1.8 SUBMITTAL DATA (SEE SECTION 1B)

- A. Review of submittal data is only for general conformance with the design concept of the Project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for: Dimensions, which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades and the satisfactory performance of his work.
- B. Contractor will be limited to one (1) review on a singular piece of equipment.
- C. The listing of a manufacturer as "acceptable" does not imply automatic compliance with Contract Documents. It is the sole responsibility of the Contractor to insure that any price quotations received and submittals made are for equipment/systems, which meet or exceed the specifications included herein.

### PART 2 - PRODUCTS

#### 2.1 PROTECTION OF FIXTURES AND WARES

- A. This Contractor shall apply the necessary protective coverage to fixtures and other equipment to prevent scratches and mars to such equipment as a result of falling objects or work of other trades.

#### 2.2 STORAGE

- A. This Contractor shall provide and be responsible for safe storage of his materials and such storage shall not interfere with the work of others or progress of the Project in any manner.

#### 2.3 EQUIPMENT ENCLOSURES

- A. Provide enclosures, which mate properly with the equipment to be enclosed and are NEMA rated to suit the atmospheric conditions of the equipment surroundings.
- B. Equipment in corrosive atmospheres shall be rated NEMA 4X. All NEMA 4X equipment shall be stainless steel. Painted steel is not acceptable for NEMA 4X applications.

### PART 3 - EXECUTION

#### 3.1 COORDINATION

- A. Before installing any work, this Contractor shall coordinate the electrical work with all other Contractors on the Project. Coordinate with work of separate concurrent projects running simultaneously in the buildings. Adjust work plans as required to coordinate with other projects or trades.

- B. All electrical work shall be installed in proper sequence and so arranged with other trades that there will be no delay in the proper installation and completion of any part or parts of all piping systems and mechanical equipment.
- C. This Contractor shall carefully examine the drawings and shall be responsible for the proper fitting of equipment and conduit as indicated without major alteration. If alterations are required, a detailed drawing of the proposed departure due to actual field conditions or other causes shall be submitted to the Contracting Officer for approval.
- D. Whenever interferences might occur, before installing any of the work in question, the Electrical Contractor shall consult with other Contractors and shall come to an agreement with them as to the exact location and level of his conduit bus duct, light fixtures and/or parts of his installation.
- E. All changes in the work of this Contractor, caused by his neglect to follow these instructions, shall be made at this Contractor's expense.

### 3.2 DITCHING, EXCAVATION AND BACKFILLING (NOT USED)

### 3.3 CONNECTIONS FOR EQUIPMENT

- A. Coordinate the hook up of the following equipment with the Contractor required to furnish and install them.

#### Mechanical Equipment

- B. Verify fuse and/or circuit breaker requirements for electrical connections to equipment and provide overcurrent devices accordingly.
- C. The plans indicate the locations of system devices. The Contract shall include the wiring system required to interconnect the indicated devices to result in a complete, operating system. The interconnecting wiring shall be in conformity with the requirements of the manufacturer of the equipment as well as with other requirements set out herein. The basic wiring method to be employed is indicated herein.

### 3.4 WORK IN EXISTING BUILDING

- A. Inasmuch as work under this Contract includes adding to in the existing building, it shall be the responsibility of each Bidder to fully inform himself of any and all conditions which influence or are influenced by work contemplated by these specifications and accompanying drawings. The submission of a proposal by any Bidder will be construed as an admission by him that he has examined and is fully familiar with the premises and all conditions thereon and adjacent thereto, and has included in this proposal a proper and adequate amount to cover rearrangement of old work for the proper installation and operation of the new and existing equipment as shown on the drawings specified herein or as required. Such work shall be neatly and properly done.
- B. Maintain existing electrical service and feeders to occupied areas and operational facilities, unless otherwise indicated or when authorized otherwise in writing by Contracting Officer. Provide temporary service during interruptions to existing facilities. When necessary, schedule momentary outages for replacing existing wiring systems with new wiring systems. When that "cutting-over" has been successfully accomplished, remove, relocate or abandon existing wiring as indicated.
- C. The operation of all special systems within the building shall be maintained, including but not limited to fire alarm, telephone, intercom, communication, data, security, emergency call, etc. Provide temporary

connections/equipment as necessary for required sequence of construction. Any necessary momentary outages shall be scheduled with the Contracting Officer prior to starting such work.

### 3.5 DEMOLITION AND REMOVAL OF EXISTING EQUIPMENT AND MATERIALS

- A. Existing conduits that are made spare by demolition work shall be removed unless concealed in existing construction.
- B. All conduits and conductors shown to be reused shall be thoroughly tested and checked for insulation breakdown and continuity.
- C. Electrical items must be removed where they interfere with or are not concealed by new construction such as new ceilings, walls, etc.
- D. Existing control panels, devices and other equipment and material shall be relocated, removed, reconnected or left in place as indicated on the drawings. Where an existing device is shown removed from an existing circuit, new wiring shall be provided as required to insure continuity of existing circuit. If existing devices or other electrical items, such as electrically operated equipment interfere with the relocation of existing equipment, new equipment, etc., the existing items including electrical components of electrically operated equipment shall be disconnected and removed or satisfactorily relocated and reconnected even though not specifically indicated on the drawings. All material removed which is considered salvageable by the Contracting Officer and is not specifically designated to be reused on the drawings or not practical to be reused shall remain in the property of the Contracting Officer and shall be neatly stockpiled in a specially designated location.

### 3.6 CLEANING

- A. This Contractor shall at all times keep the premises free of all waste or surplus materials, rubbish and debris which is caused by his employees or resulting from his work.
- B. After all equipment and fixtures have been installed and building is ready for occupancy, the Electrical Contractor shall remove all stickers, rust stains, labels, temporary covers, plaster marks, paint spots, etc. All foreign matter shall be blown out or flushed out of all conduits, panels, motors, devices, switches, fixtures, etc.
- C. Identification plates and trims on all equipment shall be free of paint and polished.
- D. The Contractor shall leave the electrical portion of the work in a safe clean and very neat condition ready for operation.

### 3.7 RECORD DRAWINGS

- A. The Contractor shall maintain an up-to-date set of plans and specifications on the Job Site. He shall mark all Addendum Items and any field changes on this set and see that a copy of all changes is furnished to the Contracting Officer at the end of the Project.
- B. The drawings shall also include as-built conditions such as equipment locations, power sources and devices, etc.

### 3.8 INSTRUCTION IN OPERATION BOOKS AND SPARE PARTS

- A. After all tests and adjustments have been made, the Contractor shall furnish the necessary qualified personnel to place the special systems in continuous operation, during which time he shall provide complete Operating and Maintenance Instructions to the Contracting Officer's representative with an

outline of instructions in written form. These personnel shall reserve adequate time to instruct an Contracting Officer's representative on proper operation (including all phases of the system and each of its component parts).

- B. Contractor shall furnish Contracting Officer with seven (7) sets of all operating instructions, maintenance instruction and spare parts lists of all equipment furnished under this Contract. Lists shall include current unit prices and source of supply for each item of operable equipment.

### 3.9 FIRESTOPPING

- A. Openings around electrical penetrations through fire-resistant rated walls, partitions, floors or ceilings shall be firestopped using listed materials to maintain the fire rating. Installation shall be done in accordance with manufacturer's recommendations. Materials shall be UL Listed and labeled and FM approved for fire ratings consistent with penetrated barriers.
  - 1. Foamed-in-place type firestopping shall only be permitted in concealed-from-view locations. Sealant type firestopping shall be used in exposed-to-view locations.

### 3.10 TESTS AND ADJUSTMENTS

- A. Upon completion of installation of electrical connections, and after circuitry has been energized with rated power source test connections to demonstrate capability and compliance with requirements. Ensure that direction of rotation of each motor fulfills requirement. Correct malfunctioning units at site, then retest to demonstrate compliance.
- B. During the progress and after completion of the work included under this specification, the Contractor shall make all required tests at his own expense in the presence of the Contracting Officer as required hereinafter and by local ordinances, codes, laws and regulations. Such tests shall be in accordance with other sections of this division. The Contracting Officer shall be notified five (5) days in advance as to the time when such tests are to be performed that a representative of the Contracting Officer may be present.

END OF SECTION